

REMARKS

The Advisory Action dated 1/16/2008 ("the Advisory Action") rejected claims 1-4, 14-19, 29-32, and 34-35 under 35 U.S.C. §102(b) as being anticipated by United States Patent 6,160,846 issued to Chiang, et al. ("Chiang"). The Advisory Action also rejected claim 5 under 35 U.S.C. § 102(b) as being anticipated by United States Patent 6,167,085 issued to Saunders, et al. ("Saunders"). The Advisory Action also rejected claims 5-10, 12-13, 20-25, 27-28, 33, and 36 under 35 U.S.C. § 103(a) as being unpatentable over Chiang in view of Saunders. The Advisory Action also rejected claims 11 and 26 under 35 U.S.C. § 103(a) as being unpatentable over Chiang in view of Saunders and further in view of the United States Patent 7,079,581 issued to Noh, et al. ("Noh").

In this Amendment, Applicants have amended claims 1, 3-5, 7-14, 16, 18-20, 22-29, 31-32, and 34-35. Applicants do not surrender any equivalents of the amended claims and reserve the right to file the original claims in a continuation or divisional application. Applicants have added claims 37-42. Applicants have canceled claims 2, 6, 15, 17, 21, 30, 33, and 36. Applicants reserve the right to file the canceled claims in a continuation or divisional application. Accordingly, claims 1, 3-5, 7-14, 16, 18-20, 22-29, 31-32, 34-35, and 37-42 will be pending after entry of this Amendment.

I. Applicants' Statement of the Substance of the Interview

Applicants' representative had a telephone interview with the Examiner on 7/9/2008. The participants were Examiner David N. Werner and Applicants' representative Ali Makoui. During the interview, Applicants' representative reviewed the independent claims with the Examiner. Applicants' representative also discussed cited references, namely Chiang and Saunders. During the interview, Applicants' representative and the Examiner did not come to an agreement regarding the claims. Applicants thank the Examiner for the telephone interview.

II. Rejection of Claims 1, 3-4, and 32

The Advisory Action rejected claims 1, 3-4 and 32 under §102(b) as being anticipated by Chiang. Claims 3-4 and 32 are dependent directly or indirectly on claim 1.

Claim 1 recites a method of quantizing a particular macroblock of a particular frame in a sequence of digital video frames. The particular frame has a frame type. The method determines a buffer occupancy accumulator for the particular frame as a difference between an actual amount of bits used and a requested amount of bits for a previous frame having the same frame type as the particular frame. The method limits an amount of change in the buffer occupancy accumulator based upon the frame type. The method encodes the macroblock using a quantizer value computed based on the buffer occupancy accumulator.

Applicant respectfully submits that Chiang does not disclose or suggest the method of claim 1 for at least the following reasons. *First*, Applicant respectfully submits that Chiang does not disclose or suggest a method that determines a buffer occupancy accumulator for a particular frame. The Advisory Action cites to equation (15) of Chiang, described at column 13, lines 42-65. Applicants respectfully submit that the cited section describes the buffer fullness measure R_i for a macroblock i . This buffer fullness measure is a value computed for each macroblock of the frame presently being encoded. The buffer fullness measure is not computed for the particular frame, unlike the claimed buffer occupancy accumulator.

Second, Applicant respectfully submits that Chiang does not disclose or suggest a method that determines a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits for a previous frame having the same frame type as the particular frame. Applicants respectfully submit that the calculation of the buffer fullness measure in Chiang does not look at the actual amount of bits used and requested amount of bits for a previous frame that has the same frame type as the particular frame. Instead, the buffer

fullness measure disclosed by Chiang looks at the bits of the macroblocks of the present frame, unlike the claimed buffer occupancy accumulator.

Accordingly, Applicant respectfully submits that Chiang does not render claim 1 unpatentable. As claims 3-4 and 32 depend directly on claim 1, Applicant respectfully submits that claims 3-4 and 32 are patentable over Chiang for at least the reasons discussed above for claim 1. In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 1, 3-4, and 32.

III. Rejection of Claims 5 and 7-13

The Advisory Action rejected claim 5 under §102(b) as being anticipated by Saunders. The Advisory Action also rejected claims 5, 7-10, and 12-13 as being unpatentable over Chiang in view of Saunders. The Advisory Action also rejected claim 11 under § 103(a) as being unpatentable over Chiang in view of Saunders and further in view of Noh. Claims 7-13 are dependent directly or indirectly on claim 5.

Claim 5 recites a method of quantizing a particular macroblock of a particular frame in a sequence of digital video frames. The method determines a base quantizer value. The method determines a quantizer adjustment based on a scaling function that is different for different macroblock types. The method encodes the macroblock based on a quantizer value computed as a sum of the base quantizer value and the quantizer adjustment.

Applicants respectfully submit that neither Chiang nor Saunders discloses or suggests the method of claim 5. For instance, neither Chiang nor Saunders discloses or suggests a method that determines a quantizer adjustment based on a scaling function. The Advisory Action cites column 5, lines 45-50 of Saunders as describing a quantizer adjustment. Applicants respectfully submit that the cited section of Saunders describes carrying out trial quantizations within a range of an already-determined quantization level. However, Saunders does not describe the user of a

scaling function for determining a quantizer adjustment. Instead, Saunders simply tests out quantization levels close to an already-determined quantization level – no scaling is involved. Furthermore, Applicants respectfully submit that Chiang does not describe the determination of a quantizer adjustment, as noted on pages 14 and 15 of the Final Office Action dated 10/12/2007.

Accordingly, Applicant respectfully submits that neither Saunders, Chiang, nor their combination renders claim 5 unpatentable. As claims 7-13 depend directly on claim 5, Applicant respectfully submits that claims 7-13 are patentable over the cited references for at least the reasons discussed above for claim 5. In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 5 and 7-13.

IV. Rejection of Claims 14 and 34

The Advisory Action rejected claims 14 and 34 under §102(b) as being anticipated by Chiang. Claim 34 is dependent directly on claim 14.

Claim 14 recites a method of determining a quantizer value for quantizing a particular macroblock of a particular frame in a sequence of digital video frames. When the particular frame is a first frame type, the method computes a number of bits that should have been used to encode all previously encoded macroblocks of the particular frame by using a first formula. When the particular frame is a second frame type, the method computes the number of bits that should have been used to encode all previously encoded macroblocks of the particular frame by using a second formula. The method determines a delta value that includes a difference between a number of bits actually used to encode all previous macroblocks of the frame and the computed number of bits that should have been used. The method quantizes the particular macroblock using a quantizer value computed based on the delta value.

Applicants respectfully submit that Chiang does not disclose or suggest the method of claim 14. For instance, Chiang does not disclose or suggest a method that computes a number of

bits that should have been used to encode all previously encoded macroblocks of a particular frame by using a first formula when the particular frame is a first frame type and a second formula when the particular frame is a second frame type. The Advisory Action cites to equation 15 in column 13 of Chiang, specifically the T variable that is the target bit budget for an I, P, or B frame. However, Applicants respectfully submit that T is the bit budget for the entire frame, not a number of bits that should have been used to encode all previously encoded macroblocks of the particular frame. As such, T is not computed for quantizing a particular macroblock, but is a value for the frame.

Accordingly, Applicant respectfully submits that Chiang does not render claim 14 unpatentable. As claim 34 depends directly on claim 14, Applicant respectfully submits that claim 34 is patentable over Chiang for at least the reasons discussed above for claim 14. In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 14 and 34.

V. Rejection of Claims 16, 18-19, and 35

The Advisory Action rejected claims 16, 18-19, and 35 under §102(b) as being anticipated by Chiang. Claims 18-19 and 35 are dependent directly or indirectly on claim 16.

Claim 1 recites a computer readable medium storing a computer program which when executed by at least one processor quantizes a particular macroblock of a particular frame in a sequence of digital video frames. The particular frame has a frame type. The computer program determines a buffer occupancy accumulator for the particular frame as a difference between an actual amount of bits used and a requested amount of bits for a previous frame having the same frame type as the particular frame. The computer program limits an amount of change in the buffer occupancy accumulator based upon the frame type. The computer program encodes the macroblock using a quantizer value computed based on the buffer occupancy accumulator.

The Advisory Action rejected claim 16 on the same rationale as claim 1. Accordingly, for reasons similar to those stated above for claim 1, Applicant respectfully submits that Chiang does not disclose or suggest either (i) a computer program that determines a buffer occupancy accumulator for a particular frame or (ii) a computer program that determines a buffer occupancy accumulator as a difference between an actual amount of bits used and a requested amount of bits for a previous frame having the same frame type as the particular frame.

Accordingly, Applicant respectfully submits that Chiang does not render claim 14 unpatentable. As claim 34 depends directly on claim 14, Applicant respectfully submits that claim 34 is patentable over Chiang for at least the reasons discussed above for claim 14. In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 14 and 34.

VI. Rejection of Claims 20 and 22-28

The Advisory Action rejected claims 20, 22-25, and 27-28 under § 103(a) as being unpatentable over Chiang in view of Saunders. The Advisory Action also rejected claim 26 under § 103(a) as being unpatentable over Chiang in view of Saunders and further in view of Noh.

Claim 20 recites a computer readable medium storing a computer program which when executed by at least one processor quantizes a particular macroblock of a particular frame in a sequence of digital video frames. The method determines a base quantizer value. The method determines a quantizer adjustment based on a scaling function that is different for different macroblock types. The method encodes the macroblock based on a quantizer value computed as a sum of the base quantizer value and the quantizer adjustment.

The Advisory Action rejected claim 20 on the same rationale as claim 5. Accordingly, for reasons similar to those stated above for claim 5, Applicant respectfully submits that neither Chiang, Saunders, nor their combination discloses or suggests a computer program that

determines a quantizer adjustment based on a scaling function that is different for different macroblock types.

Accordingly, Applicant respectfully submits that neither Saunders, Chiang, nor their combination renders claim 20 unpatentable. As claims 22-28 depend directly on claim 20, Applicant respectfully submits that claims 22-28 are patentable over the cited references for at least the reasons discussed above for claim 20. In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 20 and 22-28.

VII. Rejection of Claims 29 and 31

The Advisory Action rejected claims 29 and 31 under § 102(b) as being anticipated by Chiang. Claim 31 depends directly on claim 29.

Claim 29 recites a computer readable medium storing a computer program which when executed by at least one processor determines a quantizer value for quantizing a particular macroblock of a particular frame in a sequence of digital video frames. When the particular frame is a first frame type, the computer program computes a number of bits that should have been used to encode all previously encoded macroblocks of the particular frame by using a first formula. When the particular frame is a second frame type, the computer program computes the number of bits that should have been used to encode all previously encoded macroblocks of the particular frame by using a second formula. The computer program determines a delta value that includes a difference between a number of bits actually used to encode all previous macroblocks of the frame and the computed number of bits that should have been used. The computer program quantizes the particular macroblock using a quantizer value computed based on the delta value.

The Advisory Action rejected claim 29 on the same rationale as claim 14. Accordingly, for reasons similar to those stated above for claim 14, Applicant respectfully submits that Chiang does not disclose or suggest a computer program that computes a number of bits that should have

been used to encode all previously encoded macroblocks of a particular frame by using a first formula when the particular frame is a first frame type and a second formula when the particular frame is a second frame type.

Accordingly, Applicant respectfully submits that Chiang does not render claim 29 unpatentable. As claim 31 depends directly on claim 29, Applicant respectfully submits that claim 31 is patentable over Chiang for at least the reasons discussed above for claim 29. In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 29 and 31.

VIII. New Claims 37-42

In this Amendment, Applicants have added new claims 37-42. Applicants submit that these claims are fully supported by the specification and that these claims are patentable over the cited references.

CONCLUSION

In view of the foregoing, it is submitted that all the pending claims, namely 1, 3-5, 7-14, 16, 18-20, 22-29, 31-32, 34-35, and 37-42, are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date.

Applicants believe that all required fees have been submitted. Applicants believe that no additional fee is required for the submission of this amendment and response. However, in the unlikely event that the Commissioner determines that additional fee, extension and/or other relief is required, Applicants petition for any required relief including extensions of time. Moreover, Applicants authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 50-3804** referencing **APLE.P0037**.

Respectfully submitted,

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A handwritten signature in dark ink, appearing to read 'Ali Makoui', is written over a horizontal line.

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